

The Prototype Pattern



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Overview



Classification: Creational

Uses a given instance as a prototype

Creates a clone of the prototype

Clone can have different attributes

Reduce number of classes

Run-time inheritance

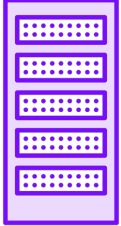


Computer Models



Laptop

Processor, RAM, SSD, Graphics, Screen (touch)



Tower

Processor, RAM, HD, Graphics, (Monitor)

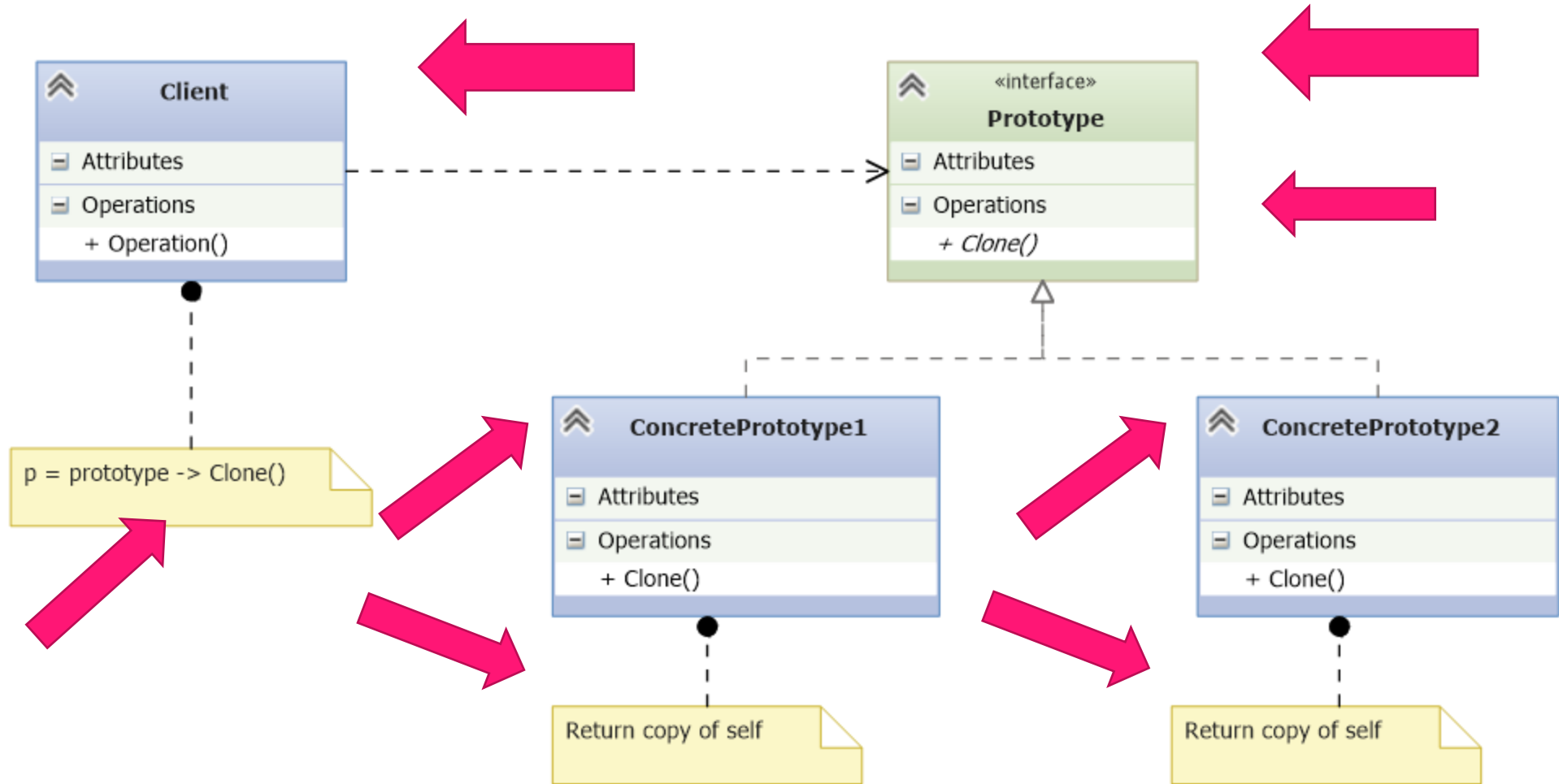


All-in-one

Processor, RAM, SSD, Graphics, Screen



Prototype Pattern Structure



Demo



Shallow cloning

- Custom computer builder



Shallow Copy

A shallow copy constructs a new compound object and then (to the extent possible) inserts references into it to the objects found in the original.



Deep Cloning

Python: `copy . deepcopy ()`

Recursively copies objects found in the original

May cause a recursive loop

May copy too much



Demo



Deep cloning



Demo



Using a prototype manager



Summary



Prototype pattern

Decrease number of classes

Competes with Abstract Factory

Implementations:

- Shallow cloning
- Deep cloning
- Prototype manager

Use deep cloning carefully

Custom cloning